

# THE MOLLUSCAN FAUNA OF THE ELK RIVER IN TENNESSEE AND ALABAMA

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## ABSTRACT

This survey was part of an intensive effort to document the Cumberlandian mussel fauna from tributary streams located in the southern Appalachian Mountains and the Cumberland Plateau region. Approximately 201 km (125 miles) of the Elk River was float-surveyed by boat using snorkeling and scuba-diving sampling techniques. Thirty-eight species of freshwater mussels, including 11 Cumberlandian forms and six species of river snails, were found living in the Elk River. Isom's (1973) preimpoundment mussel survey of the Elk River from 1965 to 1967 documented 35 species of freshwater mussels at one collecting site immediately below Tim's Ford Dam. Closure of Tim's Ford Dam in December 1970 has significantly affected the molluscan fauna below the dam. During our present survey, only one live species of river snail was found for a distance of almost 13 km (8 miles) below the dam.

The Elk River, located in south-central Tennessee, flows from the western edge of the Cumberland Plateau in Grundy County westward, where it joins the Tennessee River in Wheeler Reservoir. The Elk is 321.8 km (200 miles) long, of which 201.1 km (125 miles) is impounded.

The Elk River, including tributary streams, drains approximately 868 km<sup>2</sup> (2,249 square miles) through three geologic subdivisions: (1) the Cumberland Plateau, (2) the Highland Rim, and (3) the Central Basin. These geological subdivisions are all sedimentary in origin and consist principally of limestones and shales.

Two sizable impoundments are located on the Elk River: at 273.5 km, Wood's Reservoir, and at 212.4 km, Tim's Ford Reservoir. Both of these reservoirs are located in Franklin County, Tennessee. Wood's Dam, built by the Army Corps of Engineers between 1950 and 1952 and operated by the Arnold Engineering Development Center as a water supply reservoir, impounds approximately 19.3 km (12 miles) of the Elk River. Tim's Ford Dam, built by the Tennessee Valley Authority between 1966 and 1970, is operated by TVA for flood control, water supply, and power generation impounds an additional 54.7 km (34 miles) of the Elk. In addition, the lower 49.9 km (31 miles) of the Elk River in Limestone County, Alabama, is inundated by backwaters of Wheeler Reservoir, a mainstream impoundment on the Tennessee River operated by the Tennessee Valley Authority for navigation and flood control.

The Elk is one of several major tributary streams that form the headwaters of the Tennessee River system. These tributary streams, associated with the southern Appalachian

Mountains and the Cumberland Plateau region, contain a rich assemblage of freshwater mussels endemic to the Tennessee drainage. Ortmann (1925) referred to these species as the Cumberlandian fauna. Surveys conducted in 1924 (Remington and Clench, 1925), 1925 (Ortmann, 1925), and from 1965 to 1967 (Isom et al., 1973) documented the presence of a total of 61 species of freshwater mussels and 5 species of river snails occurring in the Elk River.

This paper presents the results of a 1980 Elk River dive-float survey for freshwater mussels that was part of a broader survey of the Cumberlandian mussel fauna in Tennessee River tributary streams designed to provide information for TVA's Cumberlandian Mollusk Conservation Program.

## METHODS AND MATERIALS

From June through September 1980, the Elk River was floated between access points using canoes and flat bottom river boats. Each riffle or gravel shoal encountered was sampled for freshwater mussels and snails, as were the pool areas at the head of each shoal. Each site was sampled using wading, snorkeling, and scuba diving sampling techniques. Approximately four to five divers were utilized during this survey, and average time spent for each person sampling per shoal was estimated at between 45 and 60 minutes. All freshwater mussels were identified in the field, and representative voucher specimens of mussels and snails were returned to the laboratory for positive identification, enumera-

tion, and storage at TVA's fisheries laboratory at Norris, Tennessee. A total of 108 collecting sites representing a distance of almost 201 km (125 river miles) was sampled (Table 1, Fig. 1).

**Table 1.** Location of all Elk River collecting sites in kilometers (km) and river miles (ERM) and number of live mollusk species found at each site, June–September 1980.

Site	km	Elk River mile	Number of Species
1	45.1	28.0 (Gallus Island—Limestone Co., AL)	6
2	50.2	31.2 (Mason Island—Limestone Co., AL)	8
3	55.9	34.8 (Giles Co., TN)	14
4	59.8	37.2 (Whitfield Island—Giles Co., TN)	12
5	66.5	41.3 (Ward Bluff—Giles Co., TN)	2
6	72.1	44.8 (Giles Co., TN)	14
7	72.9	45.3 (Above Holland Creek—Giles Co., TN)	8
8	76.1	47.3 (Giles Co., TN)	8
9	80.5	50.0 (Giles Co., TN)	6
10	82.1	51.0 (Persimmon Island—Giles Co., TN)	7
11	86.9	54.0 (Below RR crossing—Giles Co., TN)	11
12	89.8	55.8 (Lincoln Co., TN)	10
13	93.3	58.0 (Lincoln Co., TN)	8
14	94.9	59.0 (Mitchell Bend—Lincoln Co., TN)	8
15	96.5	60.0 (Lincoln Co., TN)	9
16	104.6	65.0 (Below Carr Creek—Lincoln Co., TN)	4
17	110.5	68.7 (Hovis Bend Island—Lincoln Co., TN)	8
18	113.0	70.2 (Below Moline Creek—Lincoln Co., TN)	2
19	113.4	70.5 (Lincoln Co., TN)	22
20	115.2	71.6 (Island at Pearl City—Lincoln Co., TN)	8
21	115.8	72.0 (Lincoln Co., TN)	8
22	118.7	73.8 (Lincoln Co., TN)	10
23	119.9	74.5 (Lincoln Co., TN)	14
24	121.5	75.5 (Island above Dry Creek—Lincoln Co., TN)	13
25	123.1	76.5 (Bridge crossing—Lincoln Co., TN)	14
26	126.6	78.7 (Lincoln Co., TN)	21
27	127.1	79.0 (Lincoln Co., TN)	5
28	130.0	80.8 (Pitts Bend Island—Lincoln Co., TN)	4
29	131.1	81.5 (Lincoln Co., TN)	14
30	131.9	82.0 (Suggs Bend—Lincoln Co., TN)	8
31	132.7	82.5 (Lincoln Co., TN)	5
32	133.5	83.0 (Lincoln Co., TN)	10
33	134.4	83.5 (Morgan Bend—Lincoln Co., TN)	5
34	136.8	85.0 (Lincoln Co., TN)	11
35	137.7	85.6 (Lincoln Co., TN)	1
36	140.3	87.2 (Above Cane Creek—Lincoln Co., TN)	5
37	140.9	87.6 (Lincoln Co., TN)	0
38	147.2	91.5 (Above Fayetteville—Lincoln Co., TN)	20
39	148.7	92.4 (Above Wells Creek—Lincoln Co., TN)	13
40	149.6	93.0 (Henry Bend—Lincoln Co., TN)	9

**Table 1.** Continued.

Site	km	Elk River mile	Number of Species
41	150.8	93.7 (Below Eldad Bridge—Lincoln Co., TN)	5
42	151.7	94.3 (Lincoln Co., TN)	5
43	152.1	94.5 (Lincoln Co., TN)	6
44	153.2	95.2 (Island at Lucinda Bend—Lincoln Co., TN)	5
45	154.5	96.0 (Above Lucinda Bend—Lincoln Co., TN)	16
46	155.4	96.6 (Lincoln Co., TN)	0
47	157.4	97.8 (Lincoln Co., TN)	11
48	158.8	98.7 (Lincoln Co., TN)	8
49	160.9	100.0 (Lincoln Co., TN)	7
50	162.0	100.7 (Lincoln Co., TN)	10
51	162.8	101.2 (Below Mulberry Creek—Lincoln Co., TN)	9
52	165.4	102.8 (Above Mulberry Creek—Lincoln Co., TN)	7
53	167.3	104.0 (Below Cowley Bridge—Lincoln Co., TN)	12
54	167.8	104.3 (At Dukes Creek—Lincoln Co., TN)	11
55	168.9	105.0 (Above Stephens Creek—Lincoln Co., TN)	11
56	169.3	105.2 (Lincoln Co., TN)	9
57	169.6	105.4 (Below Dickey Bridge—Lincoln Co., TN)	11
58	171.4	106.5 (Pitts Bend—Lincoln Co., TN)	19
59	172.8	107.4 (Dickey Island—Lincoln Co., TN)	11
60	176.5	109.7 (Lincoln Co., TN)	16
61	177.2	110.1 (Below Shelton Creek—Lincoln Co., TN)	5
62	177.3	110.2 (Lincoln Co., TN)	8
63	180.4	112.1 (Lincoln Co., TN)	13
64	181.0	112.5 (Shiloh Bridge—Lincoln Co., TN)	12
65	182.9	113.7 (Stiles Ford—Lincoln Co., TN)	13
66	183.6	114.1 (Lincoln/Moore Cos., TN)	6
67	184.4	114.6 (Lincoln/Moore Cos., TN)	2
68	184.7	114.8 (Sullenger Bend—Lincoln/Moore Cos., TN)	8
69	185.7	115.4 (Lincoln/Moore Cos., TN)	1
70	190.3	118.3 (Parks Island—Lincoln/Moore Cos., TN)	18
71	192.0	119.3 (Old Pam Ford—Lincoln/Moore Cos., TN)	9
72	193.1	120.0 (Below Beans Creek—Lincoln/Moore Cos., TN)	1
73	194.4	120.8 (Moore/Franklin Cos., TN)	6
74	195.0	121.2 (Cashion Bend—Moore/Franklin Cos., TN)	5
75	197.6	122.8 (Island below gauging station—Moore/Franklin Cos., TN)	1
76	199.5	124.0 (Smith Island—Moore/Franklin Cos., TN)	4
77	203.4	126.4 (Moore/Franklin Cos., TN)	1
78	210.5	130.8 (Garner Ford—Franklin Cos., TN)	0
79	211.6	131.5 (Franklin Co., TN)	1
80	212.4	132.0 (Below Tim's Ford Dam—Franklin Co., TN)	0

Table 1. Continued.

Site	km	Elk River mile	Number of Species
81	270.3	168.0 (Franklin Co., TN)	0
82	270.8	168.3 (Franklin Co., TN)	1
83	271.1	168.5 (Franklin Co., TN)	0
84	272.7	169.5 (Wood's Reservoir Dam—Franklin Co., TN)	4
85	300.9	187.0 (Franklin/Coffee Cos., TN)	8
86	301.4	187.3 (Rutledge Ford—Franklin/Coffee Cos., TN)	5
87	301.7	187.5 (Franklin/Coffee Cos., TN)	0
88	302.2	187.8 (Franklin/Coffee Cos., TN)	3
89	303.3	188.5 (Above Mud Creek—Franklin/Coffee Cos., TN)	1
90	304.1	189.0 (Above Betsy Willis Creek—Franklin/Coffee Cos., TN)	2
91	306.2	190.3 (Bluebell Island—Franklin Cos., TN)	6
92	307.6	191.2 (Grundy Co., TN)	5
93	308.1	191.5 (Grundy Co., TN)	1
94	308.6	191.8 (Below Patton Creek—Grundy Co., TN)	2
95	309.2	192.2 (Below I-24 Bridge—Grundy Co., TN)	5
96	310.4	192.9 (Above Caldwell Creek—Grundy Co., TN)	4
97	310.9	193.2 (Grundy Co., TN)	4
98	311.5	193.6 (Ford at Bells Mill—Grundy Co., TN)	4
99	312.1	194.0 (Below Highway 41 Bridge—Grundy Co., TN)	2
100	313.0	194.5 (Above Highway 41 Bridge—Grundy Co., TN)	5
101	313.6	194.9 (Grundy Co., TN)	6
102	313.9	195.1 (Grundy Co., TN)	4
103	316.2	196.5 (Grundy Co., TN)	4
104	316.8	196.9 (Grundy Co., TN)	4
105	318.6	198.0 (Grundy Co., TN)	3
106	320.5	199.2 (Below Sartain Spring—Grundy Co., TN)	4
107	321.0	199.5 (Above Sartain Spring—Grundy Co., TN)	3
108	321.8	200.0 (Burrow Cove—Grundy Co., TN)	3

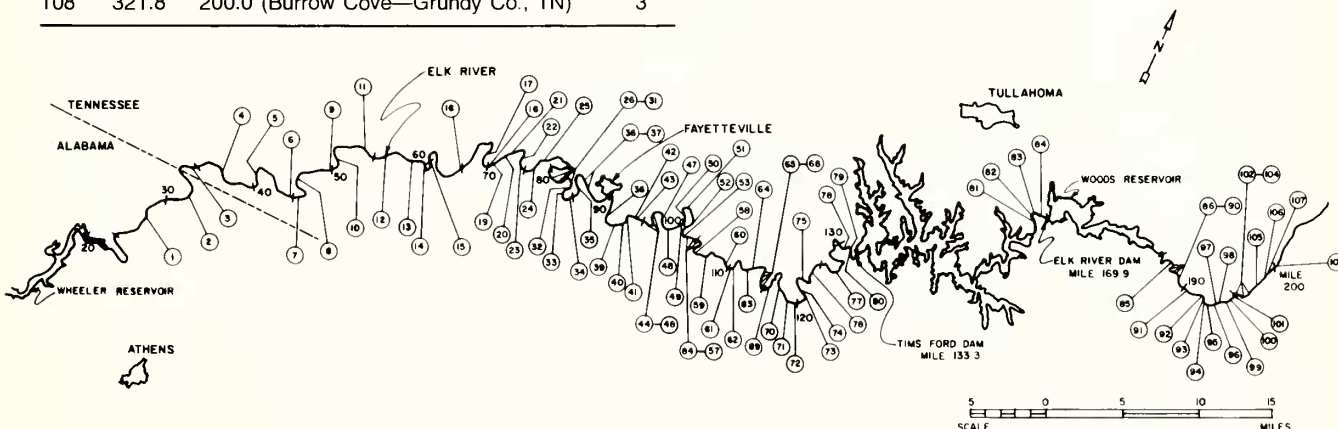
## RESULTS AND DISCUSSION

Live or freshly dead specimens of 38 species of freshwater mussels including 11 Cumberlandian forms and six species of river snails were found during this survey (Table 2). Four of the 11 Cumberlandian species (*Conradilla caelata*, *Fusconaia cuneolus*, *Fusconaia edgariana*, and *Quadrula intermedia*) are listed as endangered by the U.S. Fish and Wildlife Service.

Eleven species of freshwater mussels were found in the upper Elk River above Wood's Dam Reservoir between sites 85 and 108. This portion of the Elk is heavily impacted by sand and silt runoff from adjacent farmlands. Collecting sites immediately below Wood's Dam Reservoir sites 81–84 were practically devoid of any living mussels. This portion of the Elk is affected by water releases from Wood's Dam and a landfill project adjacent to the river. Only two species of mussels (*Elliptio dilatatus* and *Villosa nebulosa*) represented by one specimen each were found.

Collecting sites closest to Tim's Ford Dam between sites 77 and 80 produced no live mussels. Numerous dead shells and large areas of unstable, shifting substrate were observed in this section of the Elk. In comparison, Isom et al. (1973) collected 34 species of freshwater mussels directly below the construction site at Tim's Ford Dam (presently site 80) between 1965 and 1967.

Isom et al. (1973) stated that "the mussel fauna downstream from Tim's Ford Dam will survive only if conditions for a warm water fishery are met." As a storage impoundment with a hypolimnal discharge, Tim's Ford Dam causes the river downstream to differ significantly from both preimpoundment conditions in the same area [and] from comparable unregulated stream reaches above the reservoir. These postimpoundment differences include altered temperature regimes, extreme water-level fluctuations, and seasonal oxygen deficits. Biological responses attributable to these environmental changes typically include reduced fish and benthic macroinvertebrate communities that can tolerate these conditions (Isom, 1971). Further, changes or reductions in the fish fauna



**Table 2.** Number of each mollusk species found during qualitative sampling of the Elk River, June through September 1980.

Species	Ortmann (1925)	Isom (1973)	Ahlstedt (1980)	COLLECTING SITES																				
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Mussels:																								
<i>Actinonaias carinata</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Actinonaias pectorosa</i> +	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Alasmodonta minor</i> (=calceolus) +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Alasmodonta marginata</i>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Amblema costata</i> (=plicata)	X	X	X	-	1	3	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
<i>Anodonta grandis</i>	-	X	X	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Carunculina lividus</i> (=moesta) +	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Carunculina moesta</i> +	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Carunculina moesta</i> f. <i>cylindrella</i> + *	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Corbicula caelata</i> + *	X	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Corbicula manilensis</i>	-	X	X	-	-	-	3	-	9	-	1	3	11	2	2	-	1	3	-	2	-	1	2	
<i>Cyclonaias tuberculata</i>	-	X	X	-	1	5	2	-	31	1	1	-	1	3	4	5	1	-	-	5	-	62	1	
<i>Dromus dromas</i> + *	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia biemarginata</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia brevidens</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia capsaeformis</i> +	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia florentina</i> + *	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia haysiana</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia haysiana</i> *	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Dysnomia torulosa</i>	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Elliptio triquetra</i>	-	X	X	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	1	1	
<i>Elliptio crassidens</i>	-	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Elliptio dilatatus</i>	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Fusconaia barnesiana</i> +	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	1	-		
<i>Fusconaia barnesiana</i> f. <i>bigbyensis</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	-		
<i>Fusconaia cuneolus</i> + *	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
<i>Fusconaia edgariana</i> + *	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	1	-		
<i>Fusconaia subrotunda</i>	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	U	-	-	-		
<i>Lampsilis anodontoides</i>	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-		
<i>Lampsilis fasciola</i>	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	S	1	-	1		
<i>Lampsilis ovata</i>	-	X	X	-	-	-	-	3	1	-	-	-	1	-	-	-	-	-	E	-	1	-		
<i>Lampsilis ovata ventricosa</i>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	-	-	-		
<i>Lasmigona complanata</i>	-	X	X	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-		
<i>Lasmigona costata</i>	X	X	X	-	-	-	-	-	2	-	-	-	-	2	-	-	-	-	-	-	3	-		
<i>Lastena lata</i>	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Leptodea fragilis</i>	-	X	X	4	2	10	5	4	-	-	-	1	-	-	-	-	1	-	-	-	-	-		
<i>Lexingtonia dolabelloides</i> +	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Lexingtonia dolabelloides</i> f. <i>conradi</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-		
<i>Medionidus conradicus</i> +	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Megalania gigantea</i>	-	X	X	-	-	7	5	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Obliquaria reflexa</i>	-	X	X	1	-	2	-	-	-	1	-	1	-	-	-	-	-	-	-	1	-	4		
<i>Obovaria subrotunda</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-		
<i>Obovaria subrotunda</i> f. <i>lens</i>	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pegias fabula</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Plagiola lineolata</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pleurobema cordatum</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-		
<i>Pleurobema oviforme</i> +	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pleurobema oviforme</i> f. <i>argenteum</i> +	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Proptera alata</i>	-	X	X	7	-	3	6	4	2	2	-	-	2	1	3	1	-	1	-	-	-	-		
<i>Ptychobranthus lasiolaris</i>	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Ptychobranthus subtentum</i> +	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Quadrula cylindrica</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Quadrula intermedia</i> + *	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Quadrula metanevra</i>	-	X	X	-	-	1	-	-	3	1	-	-	-	-	-	1	-	1	-	-	2	-		
<i>Quadrula pustulosa</i>	-	X	X	-	-	-	-	-	4	-	-	-	-	-	1	2	1	1	-	-	6	-		
<i>Quadrula quadrula</i>	-	X	X	-	-	-	-	-	-	-	-	-	-	1	2	1	1	-	-	1	61	-		
<i>Strophitus rugosus</i> (=undulatus)	X	X	X	-	1	3	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-		
<i>Tritogonia verrucosa</i>	X	X	X	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Truncilla donaciformis</i>	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Truncilla truncata</i>	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa fabalis</i>	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa ins</i>	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa nebulosa</i> +	X	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa taeniata</i> +	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa vanuxemi</i> +	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Villosa</i> sp.	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total Number of Mussel Species				3	4	10	8	2	10	4	4	2	3	7	6	5	4	4		4	2	19	4	
Snails:																								
<i>Anculosa</i> (=Leptoxis) <i>praerosa</i>				1	83	157	110	-	200	148	98	114	81	261	77	624	36	243	186	64	-	38	81	
<i>Campeloma</i> sp.				-	-	-	-	-	-	-	-	1	3	-	-	-	-	1	-	-	-	-	-	
<i>Goniobasis</i> sp.				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Goniobasis laqueata</i>				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lithasia</i> (=Io) <i>verrucosa</i> <i>lima</i>				12	80	4	17	-	32	1	29	1	84	32	60	33	6	11	11	54	-	-	2	
<i>Pleurocera canaliculatum</i>				-	17	130	243	-	183	182	50	96	146	281	133	257	22	108	222	101	-	74	100	
				54	14	36	5	-	40	8	81	-	51	47	91	-	14	2	71	27	-	52	11	
Total Number of Snail Species				3	4	4	4	0	4	4	4	4	4	4	4	4	3	4	5	4	4	0	3	4

+Cumberlandian Forms

\*Endangered Species

# AHLSTEDT: ELK RIVER MOLLUSKS

[illegible]





Species	(1925)	(1926)	(1927)	(1928)	(1929)	(1930)	(1931)	(1932)	(1933)	(1934)	(1935)	(1936)	(1937)	(1938)	(1939)	(1940)	(1941)	(1942)	(1943)	(1944)	(1945)	(1946)	(1947)	(1948)	(1949)	(1950)	(1951)	(1952)	(1953)	(1954)	(1955)	(1956)	(1957)	(1958)	(1959)	(1960)	(1961)	(1962)	(1963)	(1964)	(1965)	(1966)	(1967)	(1968)	(1969)	(1970)	(1971)	(1972)	(1973)	(1974)	(1975)	(1976)	(1977)	(1978)	(1979)	(1980)	(1981)	(1982)	(1983)	(1984)	(1985)	(1986)	(1987)	(1988)	(1989)	(1990)	(1991)	(1992)	(1993)	(1994)	(1995)	(1996)	(1997)	(1998)	(1999)	(2000)	(2001)	(2002)	(2003)	(2004)	(2005)	(2006)	(2007)	(2008)	(2009)	(2010)	(2011)	(2012)	(2013)	(2014)	(2015)	(2016)	(2017)	(2018)	(2019)	(2020)	(2021)	(2022)	(2023)	(2024)	(2025)	(2026)	(2027)	(2028)	(2029)	(2030)	(2031)	(2032)	(2033)	(2034)	(2035)	(2036)	(2037)	(2038)	(2039)	(2040)	(2041)	(2042)	(2043)	(2044)	(2045)	(2046)	(2047)	(2048)	(2049)	(2050)	(2051)	(2052)	(2053)	(2054)	(2055)	(2056)	(2057)	(2058)	(2059)	(2060)	(2061)	(2062)	(2063)	(2064)	(2065)	(2066)	(2067)	(2068)	(2069)	(2070)	(2071)	(2072)	(2073)	(2074)	(2075)	(2076)	(2077)	(2078)	(2079)	(2080)	(2081)	(2082)	(2083)	(2084)	(2085)	(2086)	(2087)	(2088)	(2089)	(2090)	(2091)	(2092)	(2093)	(2094)	(2095)	(2096)	(2097)	(2098)	(2099)	(2100)	(2101)	(2102)	(2103)	(2104)	(2105)	(2106)	(2107)	(2108)	(2109)	(2110)	(2111)	(2112)	(2113)	(2114)	(2115)	(2116)	(2117)	(2118)	(2119)	(2120)	(2121)	(2122)	(2123)	(2124)	(2125)	(2126)	(2127)	(2128)	(2129)	(2130)	(2131)	(2132)	(2133)	(2134)	(2135)	(2136)	(2137)	(2138)	(2139)	(2140)	(2141)	(2142)	(2143)	(2144)	(2145)	(2146)	(2147)	(2148)	(2149)	(2150)	(2151)	(2152)	(2153)	(2154)	(2155)	(2156)	(2157)	(2158)	(2159)	(2160)	(2161)	(2162)	(2163)	(2164)	(2165)	(2166)	(2167)	(2168)	(2169)	(2170)	(2171)	(2172)	(2173)	(2174)	(2175)	(2176)	(2177)	(2178)	(2179)	(2180)	(2181)	(2182)	(2183)	(2184)	(2185)	(2186)	(2187)	(2188)	(2189)	(2190)	(2191)	(2192)	(2193)	(2194)	(2195)	(2196)	(2197)	(2198)	(2199)	(2200)	(2201)	(2202)	(2203)	(2204)	(2205)	(2206)	(2207)	(2208)	(2209)	(2210)	(2211)	(2212)	(2213)	(2214)	(2215)	(2216)	(2217)	(2218)	(2219)	(2220)	(2221)	(2222)	(2223)	(2224)	(2225)	(2226)	(2227)	(2228)	(2229)	(2230)	(2231)	(2232)	(2233)	(2234)	(2235)	(2236)	(2237)	(2238)	(2239)	(2240)	(2241)	(2242)	(2243)	(2244)	(2245)	(2246)	(2247)	(2248)	(2249)	(2250)	(2251)	(2252)	(2253)	(2254)	(2255)	(2256)	(2257)	(2258)	(2259)	(2260)	(2261)	(2262)	(2263)	(2264)	(2265)	(2266)	(2267)	(2268)	(2269)	(2270)	(2271)	(2272)	(2273)	(2274)	(2275)	(2276)	(2277)	(2278)	(2279)	(2280)	(2281)	(2282)	(2283)	(2284)	(2285)	(2286)	(2287)	(2288)	(2289)	(2290)	(2291)	(2292)	(2293)	(2294)	(2295)	(2296)	(2297)	(2298)	(2299)	(2300)	(2301)	(2302)	(2303)	(2304)	(2305)	(2306)	(2307)	(2308)	(2309)	(2310)	(2311)	(2312)	(2313)	(2314)	(2315)	(2316)	(2317)	(2318)	(2319)	(2320)	(2321)	(2322)	(2323)	(2324)	(2325)	(2326)	(2327)	(2328)	(2329)	(2330)	(2331)	(2332)	(2333)	(2334)	(2335)	(2336)	(2337)	(2338)	(2339)	(2340)	(2341)	(2342)	(2343)	(2344)	(2345)	(2346)	(2347)	(2348)	(2349)	(2350)	(2351)	(2352)	(2353)	(2354)	(2355)	(2356)	(2357)	(2358)	(2359)	(2360)	(2361)	(2362)	(2363)	(2364)	(2365)	(2366)	(2367)	(2368)	(2369)	(2370)	(2371)	(2372)	(2373)	(2374)	(2375)	(2376)	(2377)
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+Cumberlandian Forms  
\*Endangered Species

[illegible]

Table 2. Continued

	COLLECTING SITES																											
Species	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77				
Mussels:																												
<i>Actinoaia carinata</i>	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Actinoaia pectorosa</i> +	4	17	3	4	33	3	18	2	1	6	11	8	-	1	4	1	27	37	-	5	-	-	-	2	-			
<i>Alasmidonta minor</i> (=calceolus)+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Alasmidonta marginata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Ambleria costata</i> (=plicata)	-	1	-	-	-	-	8	-	-	-	-	1	-	-	-	-	3	-	-	-	-	-	-	-	-			
<i>Anodonta grandis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Carunculina livida</i> (=moesta)+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Carunculina moesta</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Carunculina moesta</i> f. <i>cylindrella</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Conradilla caelata</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Corbicula manilensis</i>	-	-	-	-	-	1	3	2	2	2	1	1	1	-	3	-	3	5	-	-	3	-	-	1	-			
<i>Cyclonaias tuberculata</i>	5	20	12	11	20	3	31	-	5	7	6	5	1	3	1	-	15	6	-	4	1	-	-	-	-			
<i>Dromus dromas</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia biemarginata</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia brevidens</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia capsaeformis</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia florentina</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia haysiana</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia torulosa</i> *	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Dysnomia triquetra</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Elliptio crassidens</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Elliptio dilatatus</i>	-	-	-	-	2	1	6	-	1	-	-	-	-	-	-	-	4	-	-	1	-	-	-	-	-			
<i>Fusconaia barnesiana</i> +	1	2	1	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-	N	-	N	O			
<i>Fusconaia barnesiana</i> f. <i>bigbyensis</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	O	-	-	O	-	O	-			
<i>Fusconaia cuneolus</i> +	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Fusconaia edgariana</i> +	-	-	-	-	-	2	1	-	-	1	-	-	-	-	-	-	3	-	M	-	-	M	-	M	-			
<i>Fusconaia subrotunda</i>	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	U	-	-	U	-	U	-			
<i>Lampsilis anodontoides</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	S	-	S	-			
<i>Lampsilis fasciola</i>	-	-	1	-	1	1	-	-	-	1	-	-	-	-	-	-	2	-	S	-	-	S	-	S	-			
<i>Lampsilis ovata</i>	3	2	7	5	4	1	2	-	-	2	1	2	-	-	-	-	11	-	F	2	-	E	1	E	-			
<i>Lampsilis ovata ventricosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L	-	-	L	-	L	-			
<i>Lasmigona complanata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	S	-	S	-			
<i>Lasmigona costata</i>	8	23	25	13	17	-	11	-	1	4	-	11	1	-	1	-	17	10	-	1	-	-	-	-	-			
<i>Lastena lata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Leptodea fragilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Lexingtonia dolabelloides</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Lexingtonia dolabelloides</i> f. <i>conradi</i> +	1	3	3	4	5	-	8	-	-	4	2	4	-	-	-	-	4	4	-	3	1	-	-	-	-			
<i>Medionidus conradicus</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Megalonaias gigantea</i>	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Obliquaria reflexa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Obovata subrotunda</i>	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Obovata subrotunda</i> f. <i>lens</i>	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Pegias fabula</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Plagiola lineolata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Pleurobema cordatum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Pleurobema oviforme</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Pleurobema oviforme</i> f. <i>argenteum</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-			
<i>Proptera alata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Ptychobranchius fasciolaris</i>	-	1	2	1	2	-	-	-	-	-	2	-	-	-	1	-	4	-	-	-	-	-	-	-	-			
<i>Ptychobranchius subtentum</i> +	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Quadrula cylindrica</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Quadrula intermedia</i> +	1	1	-	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Quadrula metanevra</i>	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Quadrula pustulosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Quadrula quadrula</i>	1	-	-	-	1	-	1	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-			
<i>Strophitus rugosus</i> (=undulatus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Tritogonia verrucosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Truncilla donaciformis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-			
<i>Truncilla truncata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Villosa fabalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Villosa ins</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Villosa nebulosa</i> +	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-			
<i>Villosa taeniata</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Villosa vanuxemi</i> +	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Villosa</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total Number of Mussel Species	8	9	9	8	15	8	12	2	4	10	8	9	3	2	5	1	15	5	-	6	4	-	-	3	-			
Snails:																												
<i>Anculosa</i> (=Leptoxis) <i>praerosa</i>	-	-	-	-	-	-	2	-	1	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-			
<i>Campeloma</i> sp.	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Goniobasis</i> sp.	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Goniobasis laqueata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
<i>Lithasia</i> (=Io) <i>verrucosa</i> <i>lima</i>	1	-	-	2	30	38	10	27	103	32	149	240	10	-	150	-	75	90	5	-	111	44	232	80	-			
<i>Pleurocera canaliculatum</i>	18	26	-	16	37	32	60	138	24	23	98	1	15	-	2	-	14	2	-	-	-	-	-	-	-			
	1	4	-	9	46	9	3	-	2	1	1	7	11	-	1	-	3	5	-	-	-	-	-	-	-			
Total Number of Snail Species	3	2	0	3	4	3	4	3	4	3	4	4	3	0	3	0	3	4	1	0	1	1	1	1	-			

+Cumberlandian Forms

\*Endangered Species